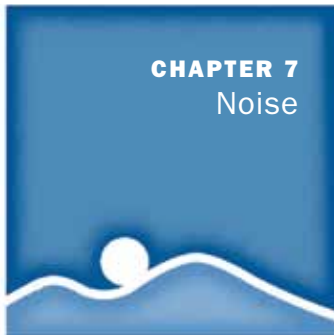


CHAPTER 7

Noise



Protecting the community from excessive or harmful noise is an important part of sustaining a high quality of life. The purpose of this Noise Element is to guide policies for addressing exposure to current and projected noise sources in Mountain View. The Element covers State Government Code requirements and the State Office of Noise Control Guidelines.

The Element begins with a Context section, followed by a Land Use Compatibility section which outlines acceptable noise standards for the City's land use categories (page 162). Then, a Looking Forward section highlights opportunities, challenges and key strategies (page 165). The final section sets forth the specific goal and policies (page 166) for each topic area.

Context

To help guide decisions on land use, this Element outlines policies to decrease noise and reduce its effects. Noise contour maps in this section show areas of the city exposed to freeway, railway and other major noise sources. By highlighting these areas and establishing noise and land use compatibility standards, the City can reduce conflicts between noise and land use and lessen noise sources that reduce the quality of life.

The Context section is organized according to these topics:

- Noise Terms and Definitions (page 158)
- Existing Noise Conditions (page 159)
- City Noise Ordinances (page 162)

Noise Terms and Definitions

This section includes some background technical terms and definitions describing noise and how it is perceived and measured. Additional technical information is in the General Plan Environmental Impact Report (EIR).

Ambient Noise Level – The all-encompassing noise associated with a given environment at a specified time, usually a composite of nearby and far-away sound from many sources coming from many directions.

Decibel (dB) – A decibel is a unit of measurement that indicates the relative amplitude of a sound. The 0 point on the dB scale is the lowest sound level

that the healthy, unimpaired human ear can detect. People can hear changes of 3dB or more; changes of less than 3dB can only be perceived in a laboratory. Sound levels in decibels are calculated logarithmically. Each 10 decibel increase sounds like the noise has approximately doubled.

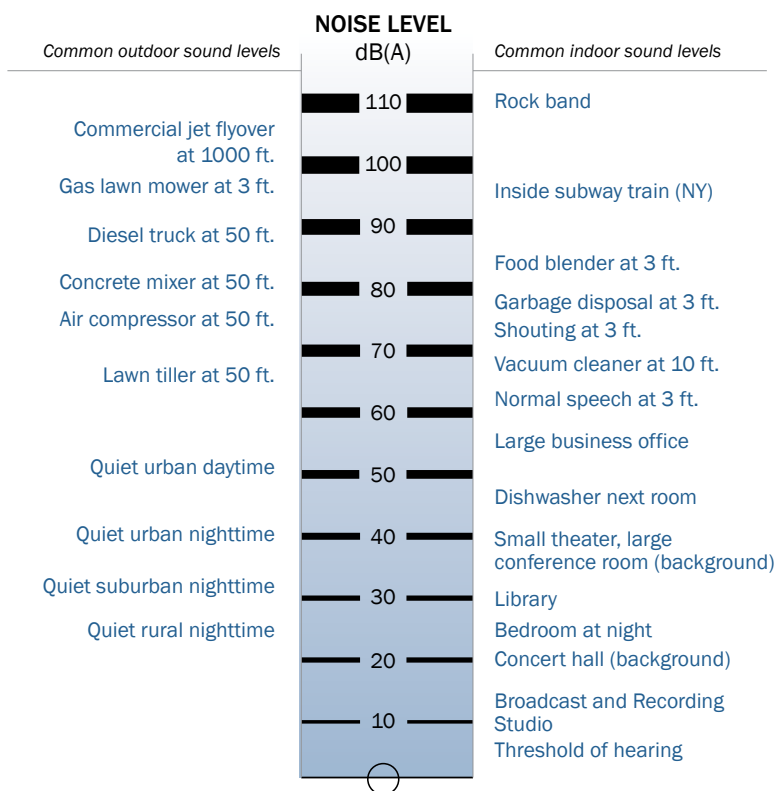
A-Weighted Sound Level (dBA) – The human ear is not equally sensitive to all sound frequencies, so there is a special frequency-dependent decibel rating scale to relate noise to human sensitivity. It is a process called “A-weighting,” expressed as “dBA.” An A-weighted decibel scale approximates the range of human sensitivity to sounds of different frequencies. All sound levels discussed in this Element are A-weighted, unless reported otherwise (Figure 7.1).

Equivalent Sound Level (Leq) – Leq represents an average of the sound energy over a specified period. It is useful because sound levels can vary substantially in a short time.

Day-Night Level (Ldn) – Ldn is the energy average of A-weighted sound levels occurring over an entire day, with a 10 dB penalty added to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.

Community Noise Equivalent Level (CNEL) – The 24-hour A-weighted average sound level from midnight to midnight, obtained after adding 5 dBA to sound levels occurring during the evening from 7 p.m. to 10 p.m. and after adding 10 dBA to sound levels at night between 10 p.m. and 7 a.m.

Figure 7.1: Typical A-Weighted Sound Levels



Source: Compiled by LSA Associates, Inc., 2009

Existing Noise Conditions

The existing noise environment in Mountain View was documented through short-term and long-term, or 24-hour, noise measurements of noise-sensitive locations throughout the city with nearby stationary noise sources. Complete noise-monitoring locations and results are documented in the General Plan Current Conditions Report, August 2009 (Chapter 12, Section 12.8 Noise).

The noise-monitoring results show that existing noise levels throughout the city ranged from 51.2 to 72.1 dBA Leq. The calculated Ldn at the long-term 24-hour noise monitoring location is 65 dBA Ldn. This range of noise level is typical of an urbanized setting that is not located near busy streets. In addition to roadway traffic, aircraft flights, landscaping maintenance equipment, construction, loading and unloading, commercial activities and everyday neighborhood activities contribute to the ambient noise environment.

Transportation Noise Sources

Primary transportation noise sources include major roadways, railways and airports, all major noise contributors in Mountain View.

Vehicle Noise

Motor vehicles and their distinctive sounds are a dominant noise source in Mountain View. The amount of noise varies according to many factors such as traffic volume, the percentage of cars and trucks, average traffic speed and the distance from a noise source. Major contributing roadway noise sources in Mountain View include Highway 101, Highway 237, Highway 85, Central Expressway, El Camino Real and other arterial and collector roadways throughout the city.

Rail Noise

Mountain View has two Caltrain stations, one at San Antonio and the other Downtown. There are four Valley Transportation Authority (VTA) light rail stations. They are Middlefield, Whisman, Evelyn and Downtown Mountain View. The NASA/Bayshore station is next to city limits. The Caltrain and VTA light rail operate daily service on separate tracks, sharing the rail corridor along Central Expressway between Whisman Road and Downtown.

The Caltrain rail line passes through the city along the south side of Central Expressway and is the dominant noise source along this corridor. The nearest land uses to this corridor include residential and commercial uses south of the rail line. On weekdays, the Caltrain line includes many commuter trains traveling north and south.

Trains and their track noise, engines and horns are intermittent. Buildings are close to the tracks with no sound walls. All of this influences the overall effect of train noise. Light rail service is not as noisy because its trains are electric and travel more slowly.

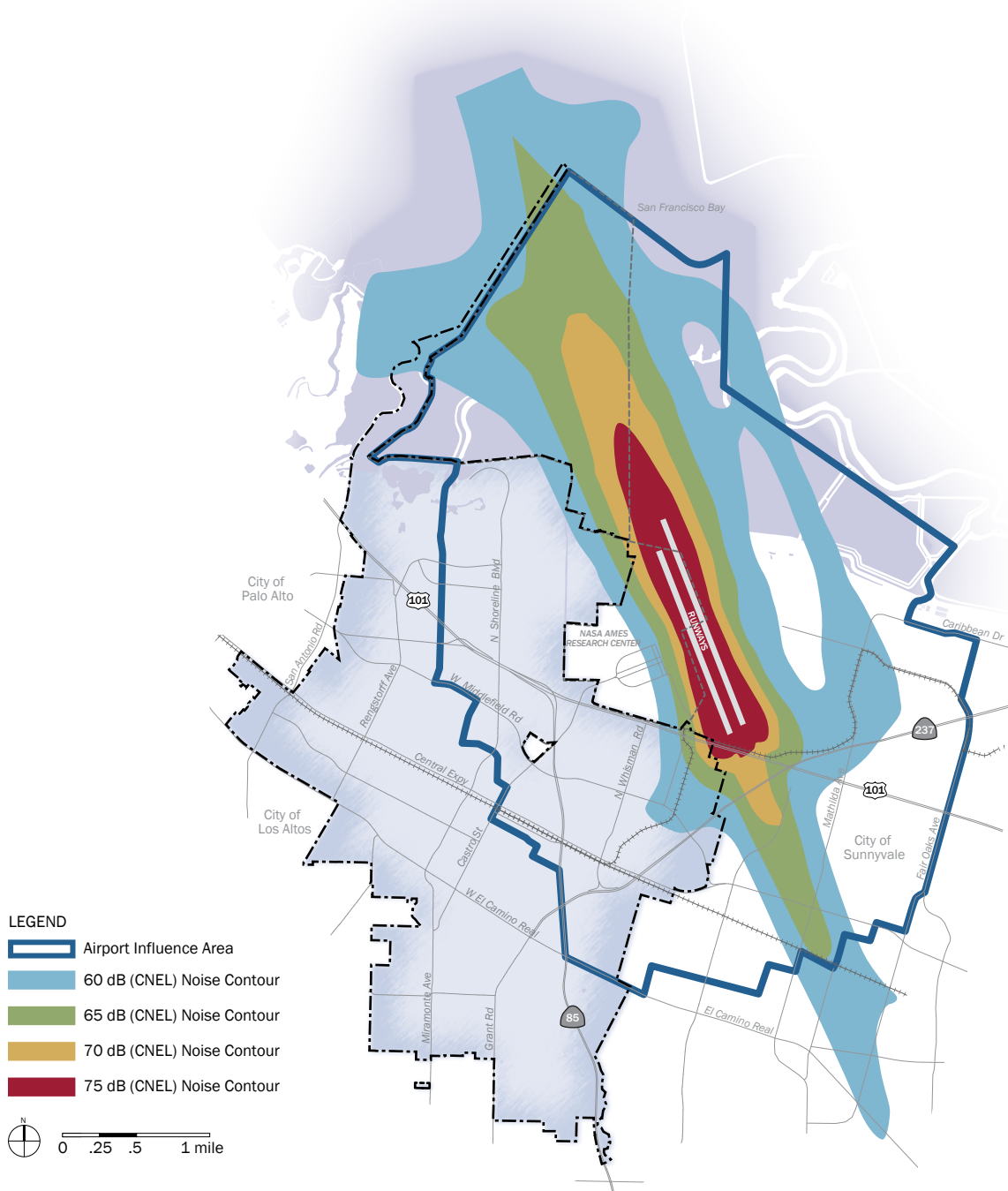
Mountain View used guidelines in the FTA publication "Transit Noise and Vibration Impact Assessment" to calculate noise levels from trains along the Caltrain rail line. The calculation assumes that trains have one diesel locomotive and about four cars traveling at up to 70 miles per hour. Without warning horns, the noise level at 50 feet from the center of the rail line is approximately 85 dBA Ldn. This level goes up to about 86 dBA when trains sound their warning horns before passing street-level railroad crossings.

High-Speed Rail

As of 2011, preliminary plans show high-speed trains operating through Mountain View on or near the Caltrain right-of-way. New trains could eliminate some current sources of noise because two street-level crossings would need to be removed to accommodate high-speed trains. This would reduce the noise from current train horns.

The high-speed trains also would likely use electric cars, which would eliminate the low-frequency sounds from diesel locomotives. However, aerodynamic effects may make high-speed trains noisier than conventional trains. Ground vibration caused by high-speed trains is expected to be similar to vibration from conventional trains with steel wheels on steel rails.

Figure 7.2: Aircraft Noise Contours, 2022, and Airport Influence Area



Map is for planning purposes only. See the Comprehensive Land Use Plan for Moffett Federal Airfield (Santa Clara County) for more information.

Source: Santa Clara County Planning Office, Airport Land Use Commission

Airport Noise

Aircraft flights over Mountain View contribute to local ambient noise levels and affect which land uses are appropriate in different areas. Airports near Mountain View include Moffett Federal Airfield, Palo Alto Airport, San Jose International Airport and San Francisco International Airport.

Moffett Federal Airfield is immediately northeast of Mountain View. Parts of the city are within its 60 dBA CNEL noise contour, including open space, business parks and industrial land, all of which are compatible uses for airport noise levels. Santa Clara County's Comprehensive Land Use Plan (CLUP) has detailed background information, policy guidance, and a noise contour map for Moffett Federal Airfield (Figure 7.2). The CLUP also includes noise restrictions and land use compatibility standards for surrounding cities, including Mountain View.

Mountain View does not have much airport noise. The city is outside the 55 dBA CNEL noise contour of the Palo Alto Airport, the San Jose International Airport and the San Francisco International Airport. These last two occasionally produce aircraft noise, but not a significant amount.

Stationary Noise Sources

Construction, cooling and heating systems, parking lots and special events are among the stationary noise sources in Mountain View.

Construction Noise

Construction noise includes demolition, excavation, delivery of materials, grading and building construction on a project site or staging area. Construction noise is typically louder than background noise, but short-term noise

stops when construction is finished. All construction activity is required to comply with the City's noise ordinance standards.

Section 8.23 of the City Code restricts the hours of operation for noise-producing construction equipment. The operation of pile drivers, steam shovels and pneumatic hammers used in construction, demolition or other repair work is restricted to the hours of 7 a.m. to 6 p.m. Monday through Friday. No noise-producing construction activity is permitted on Saturday, Sunday or holidays without written approval from the City. If the hours of construction activity change, then the general contractor, applicant, developer or owner is required to erect a sign at a prominent location on the construction site to let subcontractors and material suppliers know of the working hours.

Other Stationary Noise

Mechanical systems for heating, ventilation and air conditioning; delivery trucks idling and loading and unloading; and recreation activities and parking lot operations produce stationary noise. Service and delivery truck activities are the loudest. Loading and unloading delivery trucks can produce maximum noise levels from 75 dBA to 85 dBA Ldn at 50 feet. Typical parking lot activities generate approximately 60 dBA to 70 dBA Ldn at 50 feet.

Stationary noise sources also include business or industrial operations such as storage facilities and lumber yards. General business activity and noise from special events or festivals are also stationary sources. Seasonal concerts at Shoreline Amphitheatre produce noise in the surrounding area, including neighboring Palo Alto. As a result, the Amphitheatre has an agreement

with the City of Palo Alto to identify measures to reduce noise levels when necessary.

City Noise Ordinances

The City's codes address noise issues and protect the community from exposure to excessive noise from sources such as construction activity, animals, amplified sound and stationary equipment. These codes specify how noise is measured and regulated. The City's Zoning Ordinance also includes noise regulations and standards for uses such as drive-in and drive-through sales, commercial and industrial land uses and sensitive uses such as child-care centers. Noise is also regulated through project conditions of approval. The Mountain View Police Department and the City Attorney's office enforce noise violations.

Land Use Compatibility

The State of California identifies homes, hotels, schools and hospitals as particularly sensitive to noise. Housing is highly sensitive because noise can interfere with residents' rest and relaxation. Acceptable noise levels can also vary among different residential land uses. In general, single-family neighbor-

hoods are considered to be the most sensitive to noise. Cities may identify other uses as noise sensitive, such as parks, libraries and child-care centers. Other land uses such as commercial, industrial and office uses are generally not as sensitive to noise as housing. These uses can generate significant noise themselves, and some have lower human occupancy. Examples of these land uses include manufacturing, utilities, parking lots and transit stations.

The City has established outdoor noise environment guidelines for different land use categories (Table 7.1). These guidelines are based on sound levels that do not interfere with people's activities or threaten their well-being. The four categories are: normally acceptable, conditionally acceptable, normally unacceptable and clearly unacceptable.

The City has projected the future noise impacts from roadway, rail, airport and other sources in the community to 2030 (Figure 7.3). These projections can be used to support design considerations in new land use projects and to inform decisions on land use changes. For example, projections identify locations where new residential might be "normally unacceptable" under future conditions.

Using the Outdoor Noise Environment Guidelines (Table 7.1, next page)

- This chart provides general guidance for siting new land uses, given future noise environments.
- If a site's noise environment is in the "normally acceptable" range, conventional construction should be adequate to achieve interior noise levels compatible with activities characteristic of the land use. Figure 7.3 provides guidance for the approximate location of "normally acceptable" noise environments in 2030.
- The Noise Policies contain specific standards for noise levels in residential developments. These policies ensure that noise levels for housing are limited, both indoors and in outdoor active-use areas.

Table 7.1 Outdoor Noise Environment Guidelines

Land Use Category	Community Noise Exposure in Decibels (CNEL) Day/Night Average Noise Level in Decibels (Ldn)						
	55	60	65	70	75	80	85
Residential–Single-Family, Duplex, Mobile Homes	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Residential–Multi-Family Transient Lodging–Motels, Hotels	Normally Acceptable	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Schools, Libraries, Churches, Hospitals, Nursing Homes	Normally Acceptable	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Normally Unacceptable	Clearly Unacceptable
Auditoriums, Concert Halls, Amphitheaters, Sports Arenas, Outdoor Spectator Sports	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Playgrounds, Neighborhood Parks	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Golf Courses, Riding Stables, Water Recreation, Cemeteries	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Normally Unacceptable	Clearly Unacceptable
Office Buildings, Business Commercial and Professional	Normally Acceptable	Normally Acceptable	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Normally Unacceptable
Industrial, Manufacturing, Utilities, Agriculture	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable

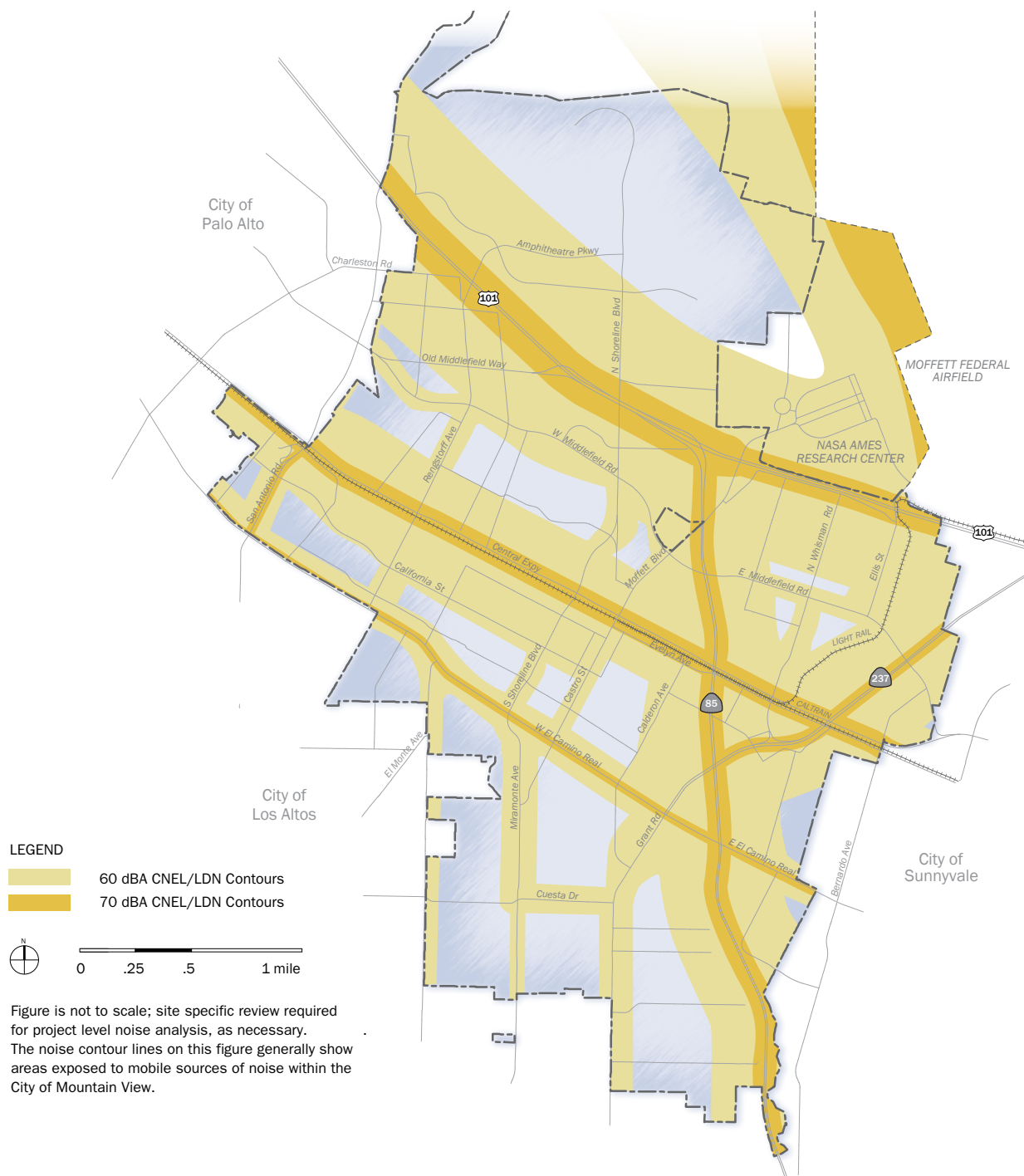
NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

NORMALLY UNACCEPTABLE
New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE
New construction or development clearly should not be undertaken.

Figure 7.3: Noise Contours, 2030



Looking Forward

Following are some distinct opportunities and challenges the City of Mountain View is likely to face over the life of the General Plan, and key strategies for addressing them. These strategies should be top priorities to advance the Noise Element goal and policies described in the next section, and inform decision making over the life of the General Plan.

City noise regulating codes. The City will update as necessary and continue enforcing City Codes regulating noise to help contribute to Mountain View's high quality of life.

Land use compatibility. During planning and development decisions, the City will continue to rely on the Outdoor Noise Environment Guidelines to ensure land use compatibility (Table 7.1).

Protection of noise-sensitive uses. Noise-sensitive uses such as residential development, schools, child-care facilities and hospitals must continue to be protected from noise and vibration impacts from freeways, arterials, railroads and airport use.

NASA Ames coordination. Coordinating with NASA Ames on development plans for the NASA Ames Research Center and continuing use of the Moffett Federal Airfield are important steps in addressing and mitigating existing and potential noise sources.

California High-Speed Rail. Construction of a proposed high-speed train system in California that would link Los Angeles to the San Francisco Bay Area could create noise and vibration impacts in Mountain View. As more information on this project becomes available, it should be used accordingly when conducting noise and vibration studies and land use planning along this corridor.

Goal and Policies

The Noise (NOI) goal is a broad statement describing the City's future direction. Policies provide more specificity for achieving this goal. Actions for implementing this goal and these policies are detailed separately in the General Plan's Action Plan.

Goal NOI-1: *Noise levels that support a high quality of life in Mountain View.*

Policies

NOI 1.1: Land use compatibility. Use the Outdoor Noise Environment Guidelines as a guide for planning and development decisions (Table 7.1).

NOI 1.2: Noise-sensitive land uses. Require new development of noise-sensitive land uses to incorporate measures into the project design to reduce interior and exterior noise levels to the following acceptable levels:

- New single-family developments shall maintain a standard of 65 dBA Ldn for exterior noise in private outdoor active use areas.
- New multi-family residential developments shall maintain a standard of 65 dBA Ldn for private and community outdoor recreation use areas. Noise standards do not apply to private decks and balconies in multi-family residential developments.
- Interior noise levels shall not exceed 45 dBA Ldn in all new single-family and multi-family residential units.
- Where new single-family and multi-family residential units would be exposed to intermittent noise from major transportation sources such as train or airport operations, new construction shall achieve an interior noise level of 65 dBA through measures such as site design or special construction materials. This standard shall apply to areas exposed to four or more major transportation noise events such as passing trains or aircraft flyovers per day.

NOI 1.3: Exceeding acceptable noise thresholds. If noise levels in the area of a proposed project would exceed normally acceptable thresholds, the City shall require a detailed analysis of proposed noise reduction measures to determine whether the proposed use is compatible. As needed, noise insulation features shall be included in the design of such projects to reduce exterior noise levels to meet acceptable thresholds, or for uses with no active outdoor use areas, to ensure acceptable interior noise levels.

NOI 1.4: Site planning. Use site planning and project design strategies to achieve the noise level standards in NOI 1.1 (Land use compatibility) and in NOI 1.2 (Noise-sensitive land uses). The use of noise barriers shall be considered after all practical design-related noise measures have been integrated into the project design.

NOI 1.5: Major roadways. Reduce the noise impacts from major arterials and freeways.

NOI 1.6: Sensitive uses. Minimize noise impacts on noise-sensitive land uses, such as residential uses, schools, hospitals and child-care facilities.

NOI 1.7: Stationary sources. Restrict noise levels from stationary sources through enforcement of the Noise Ordinance.

NOI 1.8: Moffett Federal Airfield. Support efforts to minimize noise impacts from Moffett Federal Airfield in coordination with Santa Clara County's Comprehensive Land Use Plan.

NOI 1.9: Rail. Reduce the effects of noise and vibration impacts from rail corridors.

